



Service Manual HC2500

679061 - rev. 4
GB – 08.2007

Table of contents:

Hardware versions
User menu
Extended menu of SW 1.52
Scanbox
Default values
Test

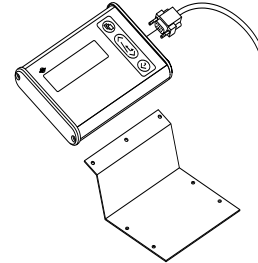
Hardware versions

There are 2 versions.

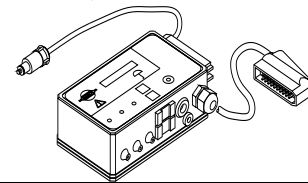
First version

From 1999 to July 2003, it includes a junction box called Scanbox.
Control box has a 20 pin connector.
Software version of the screen is up to 1.30 and it will not run on the second version.

Display



Scanbox



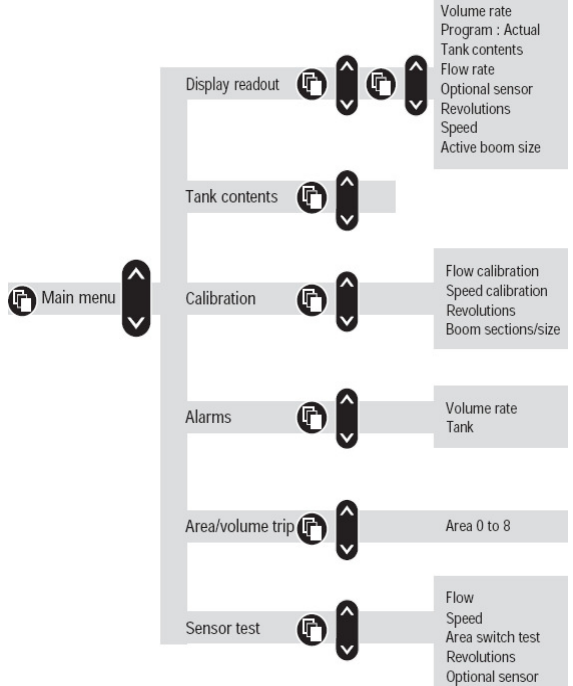
Second version

From August 2003 and on, the screen does not need a Scanbox.
The control box has a 39 pin connector.
Software version of the screen is 1.52 and up and it will also run on the first version.

Picture shows the harness block with Speed, Flow and Switch connections and the power supply cable when used as a HM 1500 on a BK control unit.



User menu

User menu	 <p>The flowchart illustrates the navigation structure of the user menu. It starts with a 'Main menu' icon. From there, users can navigate to several options: 'Display readout', 'Tank contents', 'Calibration', 'Alarms', 'Area/volume trip', and 'Sensor test'. Each of these options leads to a list of sub-menus. For example, 'Display readout' includes 'Volume rate', 'Program : Actual', 'Tank contents', 'Flow rate', 'Optional sensor', 'Revolutions', 'Speed', and 'Active boom size'. 'Calibration' includes 'Flow calibration', 'Speed calibration', 'Revolutions', and 'Boom sections/size'. 'Alarms' includes 'Volume rate' and 'Tank'. 'Area/volume trip' includes 'Area 0 to 8'. 'Sensor test' includes 'Flow', 'Speed', 'Area switch test', 'Revolutions', and 'Optional sensor'.</p>
-----------	---

Extended menu of SW 1.52

To access the extended menu, start the computer.

Press both arrow keys at the same time until the menu changes.

“Language” will start as the first item.

Extended menu is written in English only.



Page key

- To enter the menus
- To page into the menu



Arrow keys

- To find the desired menu
- To toggle between the choices
- To alter a parameter
-






Accept or Enter key

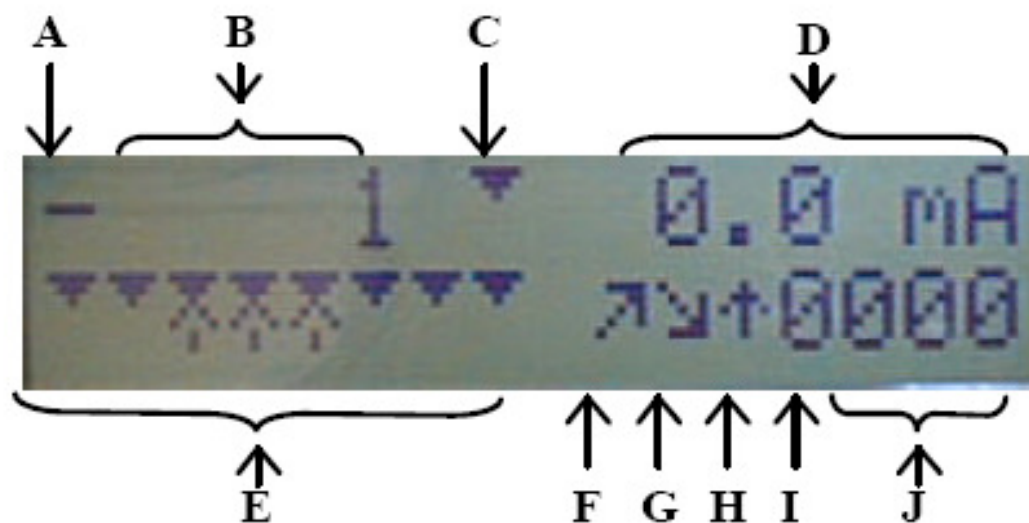
- To accept the shown setting



• To exit the menu	
NOTE: Re-start the system after leaving the extended menu.	
Menu	Function [choices] <i>Normal setting and sets shown in italics</i>
[Language]	To select language. [GB, DK, F, E, D, Cz, SF, NL, I, S]
[Unit]	To set unit of measurement. [Metric, USA]
[ON/OFF valve]	To select type of control unit. [Present, Not present] <i>For EC: Present</i> <i>For BK, EVC, EFC & SC: Not present</i>
[Pressure system]	To select pressure system. [Equalisation, No equalisation] <i>For EC & EVC: Equalisation</i> <i>For EFC: No equalisation</i>
[Control box]	To indicate control box connected. [Lunch box, Spray box, Not connected] <i>Not connected: BK</i> <i>Lunch box: Rectangular box with 20 pin connector.</i> <i>Spray box: Wave shaped box with 39 pin connector.</i>
[Tank volume max]	Pre-set tank volume indicated at start-up. Value is the maximum tanks contents value.
[Analog adjust]	To calibrate the optional transducer. Press the page key to go through the 3 items. [max., min., offset in mA] For pressure sensor, remove it from the housing to ensure 0 bar. It should show 0.0 bar +/- 0.1 bar
[Analog unit text]	To choose the unit of measurement. Press the page key to go through the items. [Bar, PSI, deg C, deg F, % R.H]
[Regulation con.]	For the sensitivity of the pressure regulation valve.

	<p>It is a percentage and minus values are possible. The higher value makes the pressure regulation valve more sensitive. Too high a value will cause oscillation and excessive wear on the valve.</p> <p><i>For EC & EVC: 30%</i> <i>For EFC: 20%</i></p>
<p>[Min. press. cycle]</p> <div data-bbox="201 734 493 920" data-label="Image">  </div> <div data-bbox="539 734 831 920" data-label="Image">  </div>	<p>Sets the minimum power supply to move the pressure regulation. Increase the value until the pressure regulation valve just starts to turn. Use “page” key to toggle between no regulation, (≡) increase pressure (↑) and decrease pressure (↓). Use “arrow” keys to raise or lower percentage until the value begins to turn.</p> <p><i>Normal value for new valve: 10%</i></p>
<p>[Change SW ver.]</p>	<p>To permit change or update of software. PIN code needed. Note serial number and contact HARDI.</p>
<p>[Master reset]</p>	<p>To reset. PIN code needed. Note serial number and contact HARDI.</p>
<p>[Area totals]</p>	<p>To see total area covered and volume sprayed.</p>
<p>[Scanbox]</p> <div data-bbox="225 1346 802 1597" data-label="Image">  </div>	<p>To change screen contrast, press arrow up or arrow down keys.</p> <p>Factory menu for visual indication whilst testing for version from 1.09 and on. It is possible to test or readout signals for:</p> <p>Line 1</p> <ul style="list-style-type: none"> • Pressure up / down • Working hour • Main valve ON/OFF • mAmp for pressure transducer if fitted <p>Line 2</p> <ul style="list-style-type: none"> • Number of sections connected & number of active sections • Flow transducer • Speed transducer • PTO sensor • Areameter switch • Extra 2, 3 & 4

Scanbox



A:

EC: ↑ = Pressure up ↓ = Pressure down — = Pressure valve not activated

EVC: ↓ = Pressure up ↑ = Pressure down — = Pressure valve not activated

B: Working hour

C: ⚡ = Main valve open ▼ = Main valve closed * EC 7 sections works opposite

D: Pressure sensor. Sensor not present = 0,00 mA. Sensor present = 4-20 mA

E: ▼ Number of sections connected ⚡ and number of active sections (max 8)

F: ↗ Flow transducer. Arrow will turn when the sensor is active.

G: ↗ Speed sensor. Arrow will turn when the sensor is active.

H: ↗ PTO sensor. Arrow will turn when the sensor is active.

I: Areameter switch 0 = No connection 1 = Connection

J: 3 extra signals, not accessible at on the present versions of Scanbox



Default values

Text	For HC 2500	For HM 1500*
[Language] [Unit] [ON/OFF valve] [Pressure system] [Control box] [Tank size] [Analog adjustment] [Analog unit text] [Regulation con.] [Duty cycle] [Flow PPU] [Speed UPP]	GB Metric Present Equalisation Lunch box 2000 l max. 10 min. 0 offset 0 mA Bar 0% 10% 120.0 1.0000	GB Metric Present Equalisation Not connected 2000 l max. 10 min. 0 offset 0 mA Bar 0% not relevant 120.0 1.0000
HM 1500*	For BK control unit with Spray (control) box for boom sections set: [Control box] to [Spray box] For EVC control unit set: [ON/OFF valve] to [Not present] [Control box] to [Spray box]	

Test

A service tool can easily be made.
It consists of;
a cable joiner strip
plugs
sockets

The plugs and sockets are connected via the cable joiner.
This now allows easy access with multi-meter probes to the metallic screws when measuring sensor voltage.



Another service tool is a pulse generator that can be used to simulate speed or flow.

Reference number is 732182.

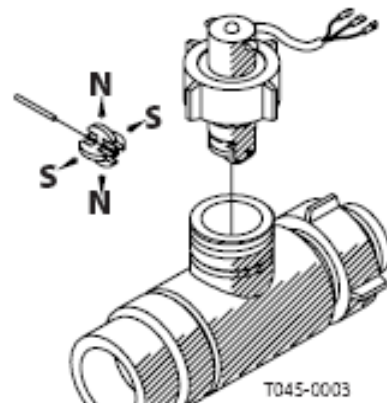
Extra connectors have been added to cater for older systems.



Flow sensor
Hall element type
Check all magnets are present.
Check spindle bushes are not worn.

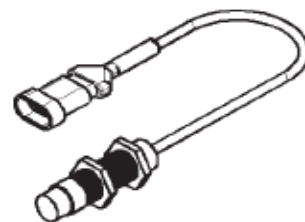
Brown to 12 volt
Black to negative
Blue to multimeter positive
Multimeter negative to negative

Normal readout:
High is 8.0 volt +/- 1 volt (Diode on)
Low is 0.3 volt +/- 0.1 volt



Speed sensor
Brown to 12 volt
Black to negative
Blue to multimeter positive
Multimeter negative to negative

Inductive type
Sensor to metal distance = 3 to 5 mm
Normal readout:
High is 12.0 volt +/- 1 volt



Low is 1.4 volt +/- 0.2 volt (Diode on)

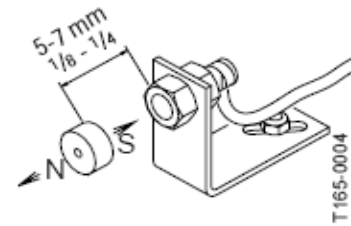
Hall Element type

Sensor to magnet distance = 3 to 7 mm

Normal readout:

High is 7.0 volt +/- 1 volt (no magnet)

Low is 0.3 volt +/- 0.1 volt



Date / Revision	Section / Subject	Pages	Written By
01-10-2007 / 04	General update of whole document		AF